What is claimed is:

1. A medical device including at least one unit cell, formed from at least two segments,

a first relatively rigid segment; and

a second relatively flexible segment, the first and second segments mechanically connected so that the first segment hinders the deformation of the second segment in a first direction, whereby the unit cell can be deformed in a second direction substantially perpendicular to the first direction, between a first substantially stable collapsed shape and a second substantially stable expanded shape.

2. A medical device as in claim 1, the unit cell having an equilibrium center position, the unit cell having a symmetrical load-displacement characteristic around the equilibrium center position.

3. A medical device as in claim 1, the unit cell having an equilibrium center position, the unit cell having an asymmetrical load-displacement characteristic around the equilibrium position, the most stable shape of the unit cell being the expanded shape.

4. A medical device as in claim 1, the unit cell having an equilibrium center position, the unit cell having an asymmetrical load-displacement characteristic around the equilibrium position, the most stable shape of the unit cell being the collapsed shape.

5. A medical device as in claim 1 in the form of a clip for holding one ~~or more~~ body parts.

6. A medical device as ~~in claim~~ 1 in the form of an expander for holding one or more ~~body~~ parts apart.

7. A medical device as in claim 1 comprising a plurality of units cells, each unit cell characterized by a point of maximum deflection of the second relatively flexible segment, wherein a majority of the first relatively rigid segments of the unit cells are connected to the second relatively flexible segments of an adjacent unit cell by means of joints, located at or near the point of maximum deflection of each of the second relatively flexible segments.

8. An expandable, hollow, stent, having the structure of claim 7, the stent having a plurality of stable configurations with different diameters, the stent having a fully collapsed configuration in which the stent has a minimum diameter and the stent having

a fully expanded configuration in which the stent has a maximum diameter.

9. The medical device of claim 1 made at least in part of a material selected from the group consisting of plastic deformable materials, elastical deformable materials, polymers, metals, composites, shape memory materials exhibiting superelastic behavior, shape memory materials exhibiting temperature sensitive behavior and combinations thereof.

10. The stent of claim 8 made at least in part of a material selected from ~~the~~ group consisting of plastic deformable materials, elastically deformable materials, polymers, metals, composites, shape memory materials exhibiting superelastic behavior, shape memory materials exhibiting temperature sensitive behavior and combinations thereof.

11. The medical device of claim 1 exhibiting increased flexibility wherein the first and second members are connected by elastic hinges.

12 The stent of claim 10 exhibiting increased flexibility wherein the first and second members of the unit cells are connected by elastic hinges.

13. The stent of claim 10 wherein the hinges are made of plastically deformable material.

14. A stent as in claim 8, wherein adjacent unit cells in a tangential and/or axial direction are joined by plastic or elastic deformable hinges thereby increasing the flexibility between adjacent unit cells in a tangential and/or axial direction.

15. A stent as in claim 14 wherein the flexibility between adjacent unit cells in a tangential and/or axial direction is increased by separating these unit cells completely from each other.

16. A multiple unit stent comprised of a plurality of stents as in claim 8, the stents connected in the axial direction by flexible joints.

17. A stent as in claim 8, the stent comprising unit cells of different shapes, sizes or operating characteristics.

18. A stent as in claim 17 where the cells are balloon expandable, self-expanding or temperature sensitive.

19. A stent as claimed in claim 8 the stent being tubular and having one or more tapered cylindrical sections.

20. ~~A stent as in claim 8 wherein at least~~ some unit cells have an asymmetrical load-

displacement/characteristic with a collapsed shape that it not stable.

21. A medical device as in claim 1 wherein the ~~unit~~ cell is triggered to move from the collapsed shape to the expanded shape or vice versa by a triggering means selected from the group consisting ~~of~~ pneumatic, hydraulic, mechanical, thermal and electromechanical means.

22. A stent as in claim 8 wherein the stent is altered between its various configurations via the use of pneumatic, hydraulic, mechanical, thermal or electromechanical triggering means.

23. A medical device as in claim 1 wherein the unit cell is made of an arrangement of relatively rigid sections, connected by plastic or elastic deformable joints.

24. A stent as in claim 8 wherein the unit cell is made of an arrangement of relatively rigid sections, connected by plastic or elastic deformable joints.

25. A medical device including at least one multistable unit cell, the multistable unit cell formed from at least four relatively rigid segments, each relatively rigid segment having a first end and a second end, each first end connected to a second end of an adjacent segment by a plastically or elastically deformable hinge and each second end connected to a first end by a plastically or elastically deformable hinge so as to formed a closed cell, whereby the multistable unit cell can be switched between a first stable fully collapsed shape and a second stable fully expanded shape.

26. A medical device as in claim 25 in the form of a stent comprising a plurality of multistable units ~~c~~ells having four relatively rigid segments, the stent having at least two stable configurations including a first fully collapsed configuration having a first area and a second fully expanded configuration having a second area larger than the first area.

27. A medical device as in claim 26 in the form of a stent wherein the multistable unit cell has:

a top segment;

a bottom segment, the bottom segment including a portion that is substantially parallel to the top segment, the parallel segment having first and second ends, and two oblique portions that are disposed at oblique angles relative to the parallel portion, each oblique portion situated at an end of the parallel portion;

a first segment connecting the bottom and top segments

and a second segment connecting the bottom and top segments, the first and second segments of substantially equal length, the cell symmetric about an axis that bisects the top and bottom segments.

28. A medical device as in claim 27 in the form of a stent wherein the multistable unit cell assumes a hexagonal shape in its expanded state.

29. A medical device as in claim 26 in the form of a stent wherein the multistable unit cell has:

a curved top segment;

a bottom segment, the bottom segment substantially parallel to the top segment,

a first segment connecting the bottom and top segments

and a second segment connecting the bottom and top segments, the first and second segments of substantially equal length, the cell symmetric about an axis that bisects the top and bottom segments.

30. A medical device having a plurality of stable configurations, the device comprised of a plurality of interconnected cells, each cell having a cell structure, the cells including a relatively rigid section and a relatively flexible section interconnected so as to define the cell structure in the form of a multistable spring system having a plurality of stable configurations.

31. The medical device of claim 30 wherein the cell structure is bistable having two stable configurations.

32. The medical device of claim 31 wherein the cells are constructed and arranged so that the device may be switched between two stable configurations by applying a uniform radially directed force.

33. The medical device of claim 31 as a tubular stent having two or more configurations including an unexpanded configuration and a fully expanded configuration, the diameter of the stent in the fully expanded configuration exceeding the diameter of the stent in the unexpanded configuration.

34. The medical device of claim 30 wherein the cells are designed and arranged to provide a range of diameters in step-wise fashion.

35. The medical device of claim 34 as a tubular stent ~~having an initial~~ diameter at a first end. a final ~~diameter at~~ a second end and an at least one intermediate diameter

between the first and second ends, the intermediate diameter differing from the initial and final diameters.

36. The medical device of claim 35 wherein the initial and final diameters are the same.

37. A tubular stent having a surface, the stent comprising a plurality of cells having a plurality of stable states, the cells on the surface of the stent, the cells having at least a first stable state and a second stable state, the cells in the second state encompassing a larger area than the cell in the first state, the cells characterized by a negative spring constant, the cells constructed and arranged so that the stent is characterized by a plurality of stable states.

38. The stent of claim 37 wherein the cells are bistable having first and second stable shapes.

39. The stent of claim 38 wherein the cells are arranged and disposed such that the stent has at least two stable states, including a first stable state in which the stent is characterized by a first diameter and a second stable state in which the stent is characterized by a second diameter, the second diameter larger than the first diameter.

40. The stent of claim 38 further having a third stable state, the third stable state having a third diameter different from the first and second diameters.

41. The stent of claim 38 wherein the cells are formed from at least two different segments:

a first segment which acts as a relatively rigid support for the cell, and

a second segment which is more pliable than the first segment, the second segment capable of existing in two distinct states, a first contracted state corresponding to the first stable state of the cell and a second expanded state corresponding to the second stable state of the cell, the first and second segments fixedly connected one to the other.

42. The stent of claim 41 wherein the cells are constructed and arranged so that the stent has two stable states, a contracted state having a first diameter and an expanded state having a second diameter larger than the first diameter.

43. The stent of claim 41 wherein the first and second segments are formed of the same material, the first segment having a first cross-sectional area and the second segment having a second cross-sectional area in excess of the first cross-sectional area.

44. The stent of claim 41 wherein the first and second segments are made of different materials, the material of the first segment being more rigid than the material of the second segment.

45. The stent of claim 41 wherein the first and second segments are made of the same material, the first segments being strengthened by heat treating so as to increase the rigidity of the first segments.

46. The stent of claim 41 having a uniform diameter and having three or more stable states. the diameter of the stent differing in each stable state.

47. The stent of claim 41 constructed and arranged to have three or more stable states, the stent having different diameters in some of the stable states, the stent comprised of a plurality of bistable cells of two or more types, the cell types requiring differing amounts of force to expand.

48. A method of implanting an expandable stent having a plurality of stable configurations comprising the steps of:

1) applying the stent to a balloon mounted on a catheter;

2) delivering the stent to a desired bodily location;

3) inflating the balloon so as to expand the stent from a first stable configuration to a desired second stable configuration, the second stable configuration exhibiting a larger diameter than the first stable configuration; and

4) deploying the expanded stent at the desired bodily location.

49. The method of claim 48 wherein the stent is applied to the balloon in the second stable configuration during the applying step and further comprising the step of:

applying radially pressure inward on the stent so as to urge the stent into the first stable configuration.

50. The method of claim 48 wherein the stent is applied to the balloon in a third stable state during the applying step, the diameter of the stent in the third stable state intermediate between the diameter in the first state and the diameter in the second state and further comprising the step of:

applying radially pressure inward on the stent so as to urge the stent into the first stable configuration.

51. An expandable stent having an initial condition and an expanded condition, the

stent having a plurality of diameters along its length in the expanded condition, the stent comprised of a plurality of cells having a plurality of stable states, the cells encompassing different areas in the different states.

52. An expandable device comprising one or more multistable loops, the loop having at least a first state and a second state, the loop encompassing a first area in the first state and a second area in the second state, wherein the device is expanded by applying a force thereto.

53. The device of claim 52 comprising a first arcuate member having first and second ends and a second arcuate member having first and second ends,

the first end of the first member in communication with the first end of the second member, and

the second end of the first member in communication with the second end of the second member,

wherein the second member is more pliable than the first, the second member capable of assuming a first stable position and a second stable position.

54. A clamp for securing a bodily member selected from the group consisting of body tissue, body organs, body lumens and body vessels comprising the device of claim 1 and further comprising a triggering means for triggering the device to alter from one state to the other.

55. A tubular graft stent comprising one or more expansion rings, each expansion ring capable of assuming first and second stable configurations,

the expansion rings formed of a first member and a second member, the second member more pliable than the first member, and having a first and a second stable position, the first stable position corresponding to the first stable configuration and the second stable position corresponding to the second stable configuration, the ring encompassing a greater area in the second stable configuration than in the first stable configuration,

the stent having a surface, the surface comprising a skin mounted on the expansion rings.

56. The stent of claim 55 wherein the skin is selected from the group of materials consisting of polymeric materials, human skin, animal skin, human tissue and animal

tissue.

57. The stent of claim 56 having two expansion rings, a first expansion ring at a first end of the stent and a second expansion ring at a second end of the stent.

58. The stent of claim 57 having a first diameter at the first end and a second diameter at the second end.

59. An stent having an unexpanded configuration and an expanded configuration, the stent having a surface,

the stent comprising:

a plurality of generally longitudinal, wave-like first members characterized by a first wavelength, and having peaks and troughs; and

a plurality of generally longitudinal wave-like second members characterized by a second wavelength, and having peaks and troughs,

the second wavelength substantially equal to the first wavelength, the second members capable of stably assuming two positions,

a first position corresponding to the unexpanded configuration in which the first and second members are in phase and

a second position corresponding to the expanded configuration, in which the first and second members are 180° out of phase, the first members more rigid than the second members,

the first and second longitudinal members disposed on the surface of the stent, the longitudinal first and second member alternating,

each peak of each first member attached to one adjacent peak of a second member in a region of attachment,

each trough of each first member attached to one adjacent trough of a second member in a region of attachment,

the regions of attachment separated by one wavelength,

whereby the stent can be snapped from the unexpanded configuration to the expanded configuration by applying a radially outward or tangential force thereto and the stent can be snapped from the expanded to the unexpanded configuration by applying a radial inward or tangential force thereto.

60. A method of joining together two bodily vessels comprising the steps of:

delivering the stent of claim 40 in a first stable state corresponding to an unexpanded configuration to a bodily site;

expanding the stent to a second stable state, the diameter of the stent exceeding the diameter of the vessels;

placing the stent over the vessels to be joined; and

contracting the stent to a third stable state, the diameter of the stent in the third stable stent intermediate between the diameter of the stent in the first and second stable states, whereby the stent rests snugly upon the vessels.

61. The method of claim 60, the stent having a first end a second end, further comprising the steps of:

positioning one or more expander rings inside the vessels and underneath a portion of the stent; and

expanding the one or more expander rings so as to clamp the vessel between the device and the stent.

62. A method of joining together two bodily vessels comprising the steps of:

delivering the stent of claim 39 in a first stable state corresponding to an unexpanded configuration to a bodily site;

placing each of the bodily vessels over at least a portion of the stent, the diameter of the vessels exceeding the diameter of the stent in the first stable state; and ;

expanding the stent to a second stable state, the diameter of the stent in the second stable state chosen so that the vessels fit snugly over the stent.

63. The method of claim 62 further comprising the steps of:

positioning one or more collars around the vessels and over a portion of the stent so as to clamp the vessel in place in between the stent and the collar.

64. A method of joining together a first and a second vessel, the first vessel having an end and the second vessel having an end, comprising the steps of:

placing a rigid support collar over the end of the second vessel;

placing at least a portion of the first vessel in at least a portion of the second vessel;

positioning an expansion device as in claim 52 in the form of an expansion ring interior to the first and second vessels; and

expanding the expansion ring so as to clamp the vessels together.

65. A stent as in claim 37 wherein the cells are expandable ~~from~~ the first to the second stable state, the expansion ~~having~~ a tangential component and an axial component.

66. A bistable valve for opening and closing a tubular device comprising:

1) a conduit, the conduit having an interior, an inner wall and an outer wall;

2) a stop surface extending across the interior of the conduit, the stop surface having an opening within;

3) a snap-action bipositional unit cell, the unit cell including

a flexible member, the flexible member substantially arcuate, the flexible member having a first end and a second end,

the first end in communication with a triggering means,

the triggering means supported by a support means emanating from the inner wall of the conduit,

the second end anchored to the stop surface,

the bipositional unit cell constructed and arranged so that the flexible member may assume a first position corresponding to a closed position and a second position corresponding to an open position;

4) a valve closure member actuated between open and closed position by the flexible member, the valve closure member constructed and arranged so as to completely close the opening ~~in~~ the stop surface when the flexible member is in the closed position, the valve closure member further constructed and arranged so that the opening is open when the flexible member is in the opened position,

whereby the conduit may be opened by triggering the triggering means so as to allow the flexible member to move between the closed position and the opened position, and

the conduit may be closed by triggering the triggering means so as to allow the flexible member to move between the opened state and the close state.

67. The bistable valve of claim 66 wherein the triggering means is a piezoelectric element, the piezoelectric element serving as a restraining means for restraining the flexible member, the piezoelectric element triggering the flexible member

to flip by undergoing a small decrease in length upon introducing a small current thereto, thereby releasing the flexible member.

68. The bistable valve of claim 66 wherein the support means is a rigid member relative to the flexible member.

69. The bistable valve of claim 66 wherein the stop surface has two oblique regions, the oblique regions being oblique relative to the longitudinal axis of the tube, with a longitudinal region therebetween, the opening disposed in the longitudinal region.

70. A medical device for use in the human body comprising the bistable valve of claim 66.

71. A medical device for use in controlling urinary incontinence, the device comprising the bistable valve of claim 66.

72. A method of controlling urinary incontinence comprising the steps of:

1) inserting a medical device as in claim 71 into a portion of a urethra; and

2) optionally clamping the medical device in place by applying a clamp to the outside of the urethra;

wherein urine may be voided by triggering the valve so as to switch it from the closed to the opened position, the valve being triggered so as to close following urination.